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New reports of decapod crustaceans from the Mesozoic and Cenozoic of Friuli-Venezia Giulia (NE Italy)

Abstract - The report of decapod crustaceans from Friuli-Venezia Giulia (NE Italy) has previously been limited to only two reports by Dainelli (1915), and Collins & Dieni (1995). The recent discovery of thalassinids, anomurans and brachyurans from some localities in Udine and Pordenone provinces increases the carcinologic knowledge from the Mesozoic and Cenozoic of Italy. The thalassinid specimens include *Corallianassa rigoi* n. sp. (superfamily Callianassoidea Dana, 1852, family Callianassidae Dana, 1852). The anomuran specimens include *Calteagalathea friulana* n. gen., n. sp. (superfamily Galatheoidea Samouelle, 1819, family Galatheidae Samouelle, 1819). The brachyuran specimens include: *Pithonoton marginatum* (v. Meyer, 1842) (superfamily Homolodromioidea Alcock, 1900, family Prosopidae v. Meyer, 1860), *Graptocarcinus bellonii* Collins & Dieni, 1995 (superfamily Dromioidea De Haan, 1833, family Dynomenidae Ortmann, 1892), *Lophoranina marestiana* (König, 1825) (superfamily Raninoidea De Haan, 1839, family Raninidae De Haan, 1839), *Portunus monspeliensis* (A. Milne Edwards, 1860), and *Portunites rosenfeldi* n. sp. (superfamily Portunoidea Rafinesque-Schmaltz, 1815, family Portunidae Rafinesque-Schmaltz, 1815), and *Titanocarcinus raulinianus* A. Milne Edwards, 1863 (superfamily Xanthoidea MacLeay, 1838, family Pilumnidae Samouelle, 1819).

Key words: Crustacea, Decapoda, Mesozoic, Cenozoic, Italy.

Riassunto - Nuove segnalazioni di crostacei decapodi nel Mesozoico e Cenozoico del Friuli-Venezia Giulia (NE Italia).

Il rinvenimento di crostacei decapodi del Friuli-Venezia Giulia (NE Italia) era finora limitato a due segnalazioni da parte di Dainelli (1915) e Collins & Dieni (1995). La recente scoperta di talassinidi, anomuri e brachiuri in alcune località delle province di Udine e Pordenone incrementa le conoscenze carcinologiche per il Mesozoico e Cenozoico d'Italia. Gli esemplari di talassinidi sono attribuiti a *Corallianassa rigoi* n. sp. (superfamiglia Callianassoidea Dana, 1852, famiglia Callianassidae Dana, 1852). Gli esemplari di anomuri sono attribuiti a *Calteagalathea friulana* n. gen., n. sp. (superfamiglia Galatheoidea Samouelle, 1819, famiglia Galatheidae Samouelle, 1819). Gli esemplari di brachiuri sono attribuiti a *Pithonoton marginatum* (v. Meyer, 1842) (superfamiglia Homolodromioidea Alcock, 1900, famiglia Prosopidae v. Meyer, 1860), *Graptocarcinus bellonii* Collins & Dieni, 1995 (superfamiglia Dromioidea De Haan, 1833, famiglia Dynomenidae Ortmann, 1892), *Lophoranina marestiana* (König, 1825) (superfamiglia Raninoidea De Haan, 1839, famiglia Raninidae De Haan, 1839), *Portunus monspeliensis* (A. Milne Edwards, 1860) e *Portunites rosenfeldi* n. sp. (superfamiglia Portunoidea Rafinesque-Schmaltz, 1815, famiglia Portunidae Rafinesque-Schmaltz, 1815) e *Titanocarcinus raulinianus* A. Milne Edwards, 1863 (superfamiglia Xanthoidea MacLeay, 1838, famiglia Pilumnidae Samouelle, 1819).

Parole chiave: Crustacea, Decapoda, Mesozoico, Cenozoico, Italia.

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Introduction and geological setting

The study of brachyurans and anomurans from the Mesozoic and Cenozoic of Friuli-Venezia Giulia (NE Italy) has previously been limited to only two reports by Dainelli (1915), and Collins & Dieni (1995). Dainelli (1915) reported four incomplete specimens of *Lophoranina marestiana* (König, 1825) from the Eocene of Buttrio and Valle del Natisone (Udine), two specimens of *Palaeocarpilius macrochelus* (Desmarest, 1822) from Monte Plauris (Udine), and one specimen of *Panopeus vicentinus* Bittner, 1875, from Buttrio. Collins & Dieni (1995) reported one incomplete chela of indeterminate pagurid and one incomplete carapace ascribed to *Graptocarcinus bellonii* Collins & Dieni, 1995, from the Upper Cretaceous (Cenomanian) of Col dei Schiosi (Altopiano del Cansiglio, Pordenone).

The recent discovery of thalassinids, anomurans, and brachyurans from some localities, Altopiano Prat, Casali Ottelio and Borgo Vigant (Udine), Val Caltea, Monte Ciaurlec, Almadis and Meduno (Pordenone) (Fig. 1), permitted increasing of the carcinologic knowledge about these systematic groups. The studied specimens are housed in Museo Friulano di Storia Naturale di Udine (MFSN) and Museo Civico di Storia Naturale di Milano (MSNM).



Fig. 1 - Location of the fossiliferous localities (Ubicazione delle località fossilifere). 1) Val Caltea; 2) Meduno; 3) Monte Ciaurlec; 4) Almadis; 5) Altopiano Prat; 6) Borgo Vigant; 7) Casali Ottelio.

Altopiano Prat

Specimen MFSN 15763 was discovered in the Calcari a Ellipsactinie of Altopiano Prat, a lateral variation of the Formazione di Fonzaso, 150-200 m thick. The Formazione di Fonzaso is composed of micritic limestone or packstone, rich in nodules. The absence of exact biostratigraphic markers does not allow an accurate dating of Formazione di Fonzaso. However, the presence of *Tubiphytes morronensis*, *Cladocoropsis mirabilis*, and the occurrence of *Saccocoma* at the top of the unity, allowed to date the Formazione di Fonzaso to the Oxfordian-Kimmeridgian age (Upper Jurassic) (Carulli *et al.*, 2000).

Val Caltea

Specimens MFSN 19965 and 19969 were discovered in Val Caltea (Pordenone) where well-stratified limestones (wackestone and mudstone) are present. These limestones are related to Calcari del Cellina, one of the three units of Calcari di Monte Cavallo. The microfascies includes *Broeckina biplana*, *Dicyclina* sp., *Nezzazata simplex*, *Nezzazatinella picardi*, rudists, ostracods, rare corals, algae and decapods. The micro- and macropalaeontological contents of Calcari del Cellina suggest an Aptian-Campanian age (Lower/Upper Cretaceous) (Carulli *et al.*, 2000).

Monte Ciaurlec

Specimens MSNM from i26578 to i26583 were discovered along the western side of Monte Ciaurlec close to casera Fossor (Pordenone) where poligenic breccias with clasts are present. These breccias are assigned to Calcari di Andreis, one of the three unity of Calcari di Monte Cavallo. The micro- and macropalaeontological contents of Calcari di Andreis suggest an Aptian-Campanian age (Lower/Upper Cretaceous) (Carulli *et al.*, 2000).

Borgo Vigant

Specimen MFSN 16937 was discovered in a large calcareous inclusion very rich in fossils, preserved inside the "flysch del Grivò" (early Eocene) close to the small village of Vigant (Udine). The benthonic foraminifers preserved in the inclusion, such as *Siderolites calcitrapoides* and *Orbitoides* sp. suggest a Maastrichtian age (Upper Cretaceous). The faunal assemblage includes bivalves, gastropods, brachiopods, corals and rare decapods (Dalla Vecchia, 2004).

Almadis

Specimens MFSN 28995 and 29046 were discovered in a quarry close to Almadis village (Pordenone) at the bed of a gradated turbiditic bank, 6 m thick. The bed is composed of a conglomerate with echinoids, foraminifers, and incomplete specimens of rudists, belonging to the "Flysch di Clauzetto", middle-upper Ypresian in age (lower Eocene) (biozone with *Morozovella formosa* and *M. aragonensis*) (Carulli *et al.*, 2000; Stefani, 1982; Venturini & Tunis, 1992).

Casali Ottelio

Specimen MFSN 29051 was discovered in the large conglomeratic bed cropping out in the hills between Buttrio and Manzano consisting of a debris flow

deriving from the Friulan Platform. The area of Casali Ottelio is very rich in foraminifers, bivalves (preserved as inner moulds), brachiopods, gastropods, decapods (usually incomplete) and echinoderms. The foraminifers, belonging to *Nummulites*, *Discocyclina*, *Assilina*, *Alveolina*, *Acarina*, and *Morozovella* allowed assignment of this faunal assemblage to early Lutetian (middle Eocene).

Meduno

Specimens MSNM i26584 and i26585 were discovered in Meduno (Pordenone) in marly sandstones, molasses, and glauconitic sandstones, Langhian in age (middle Miocene). The faunal assemblage includes teeth of fishes, molluscs, echinoids and rare decapods.

Material

The studied sample includes 19 specimens of thalassinids, anomurans, and brachyurans. We identified some specimens as belonging to species already known in Italy, and others as belonging to a new genus and new species. The specimens are preserved three-dimensionally and their preparation was easy as a result of the softness of the surrounding rock.

The infraorder Thalassinidea Latreille, 1831, includes *Corallianassa rigoi* n. sp. (6 specimens). The infraorder Anomura MacLeay, 1838, includes *Calteagalathea friulana* n. gen., n. sp. (2 specimens). The infraorder Brachyura Latreille, 1802, includes *Pithonoton marginatum* (v. Meyer, 1842) (1 specimen), *Graptocarcinus bellonii* Collins & Dieni, 1995 (1 specimen), *Lophoranina marestiana* (König, 1825) (4 specimens), *Portunus monspeliensis* (A. Milne Edwards, 1860) (2 specimens), *Portunites rosenfeldi* n. sp. (2 specimens), and *Titanocarcinus raulinianus* A. Milne Edwards, 1863 (1 specimen).

The sizes of the specimens are expressed in millimetres.

The systematic arrangement used in this paper follows the recent classification proposed by Martin & Davis (2001).

Systematic Palaeontology

Infraorder Thalassinidea Latreille, 1831
 Superfamily Callianassoidea Dana, 1852
 Family Callianassidae Dana, 1852
 Subfamily Callichirinae Manning & Felder, 1991
 Genus *Corallianassa* Manning, 1987

Type species: *Callianassa longiventris* A. Milne Edwards, 1870

Corallianassa rigoi n. sp.
 Figs. 2, 3 (a-c)

Diagnosis: well-developed chelae of cheliped, heterochelus; bigger cheliped

with elongate ischium and merus having serrate lower margin; carpus-propodus joint of bigger chela slightly tilted respect to palm axis; elongate carpus, more developed forward with lower margin having convex posterior angulation; propodus with subrectangular palm, longer than high, with serrate lower margin; fixed and movable fingers with a prominence in occludent margin.

Etymology: from R. Rigo who reported for the first time the presence of thalassinids from Monte Ciaurlec.

Holotype: MSNM i26581.

Paratypes: MSNM i26578, i26579, i26580, i26582, i26583.

Stratigraphic range: Cretaceous (Aptian-Campanian).

Type locality: Monte Ciaurlec (Pordenone).

Occurrence and measurements: six incomplete specimens (MSNM from i26578 to i26583) in which the chelae of cheliped are very well-preserved. The specimen MSNM i26580 preserves both chelae.

MSNM i26578 – not measurable.

MSNM i26579 – maximum length of propodus: 14.4; length of palm: 10.9; height of palm: 7.4 (left chela).

MSNM i26580 – maximum length of propodus: 15.0; length of palm: 12.5; height of palm: 8.4 (right chela); maximum length of propodus: 11.3; length of palm: 6.7; height of palm: 5 (left chela).

MSNM i26581 – maximum length of propodus: 14.0; length of palm: 11.1; height of palm: 8.2 (right chela).

MSNM i26582 – maximum length of propodus: 14.9; length of palm: 9.9; height of palm: 7.2 (right chela).

MSNM i26583 – maximum length of propodus: 13.6; length of palm: 8.5; height of palm: 6.2 (left chela).

Description. Well-developed chelae of cheliped, heterochelus. Bigger cheliped with elongate ischium having serrate lower margin. Elongate subcylindrical merus, more developed forward, with convex upper margin and serrate lower margin. Carpus-propodus joint of bigger chela slightly tilted respect to palm axis. Carpus, longer than high, broadening forward, with slightly convex upper margin and lower margin with convex posterior angle. Smooth outer surface of carpus with some orifices along lower margin. Propodus, longer than high, with smooth outer surface, slightly rounded. Slightly convex upper margin, and straight serrate lower margin. Fixed finger shorter than propodus, with curved lower margin, and occludent margin with prominence. Movable finger longer than fixed finger. Smaller cheliped similar in shape to bigger cheliped, with movable and fixed fingers more elongate.

Discussion. The studied specimens were ascribed to the Recent *Corallianassa* Manning, 1987, for some morphological characters of the bigger cheliped, such as the presence of spines on lower margins of ischium and merus, the elongate shape of carpus narrowing posteriorly, the subcylindrical shape of propodus having curved movable and fixed fingers with small teeth on occludent margins. These characters are also evident in the bigger cheliped of the type species figured by Manning (1987, fig. 6).

Corallianassa Manning, 1987, was described on some morphological characters of *Callianassa longiventris* A. Milne Edwards, 1870, belonging to the subfam-

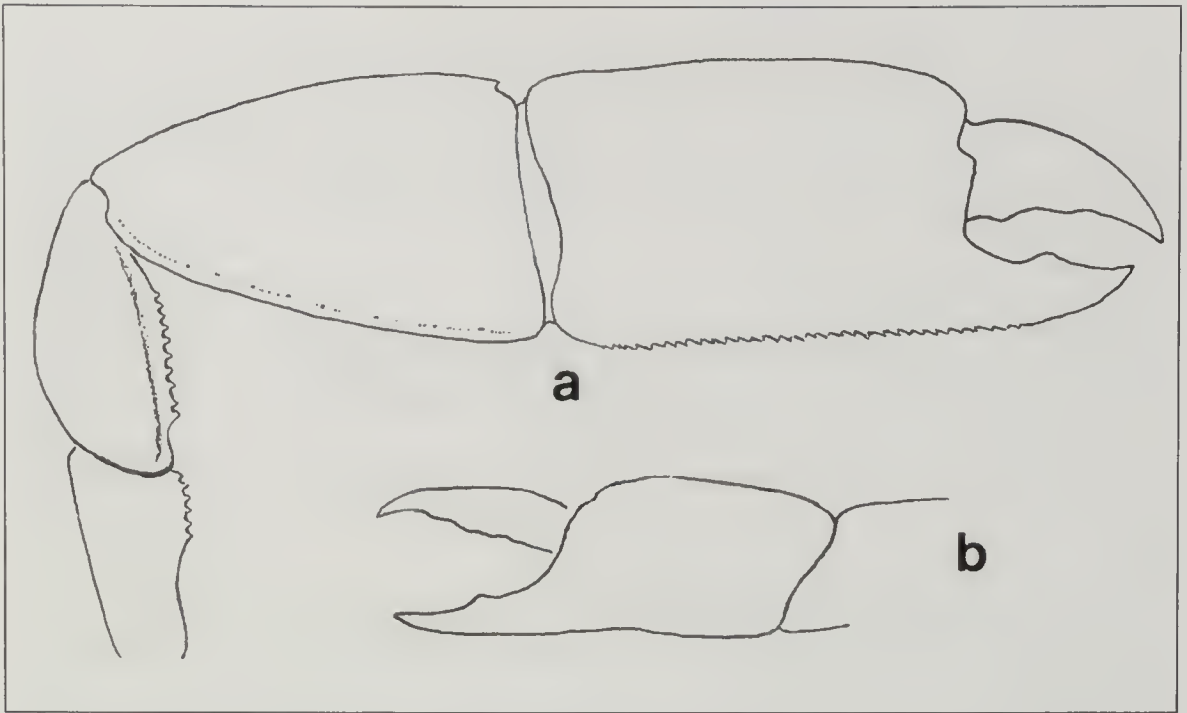


Fig. 2 - *Corallianassa rigoi* n. sp.; a) large cheliped (grande chelipede); b) small cheliped (piccolo chelipede).

ily Callichirinae Manning & Felder, 1991. The Recent species of this genus are known from the Indo-West Pacific, Caribbean, Western Atlantic and possibly the Red Sea (Manning, 1988, Manning & Felder, 1991). *Corallianassa* Manning, 1987, was synonymized with *Glypturus* Stimpson, 1866, by Sakai (1999). However, this synonymy was not supported by a recent multivariate phylogenetic analysis based on 93 morphological characters (Tudge *et al.*, 2000). Several features of this species, including ecological traits, justify a transfer to *Corallianassa* Manning, 1987 (Abed-Navandi, 2000).

The oldest fossil species belonging to this genus is *C. acucurvata* Swen, Fraaije & van der Zwaan, 2001, from the Upper Cretaceous (Maastrichtian) of Maastricht (The Netherlands) (Swen *et al.*, 2001). *Corallianassa acucurvata* differs from *C. rigoi* n. sp. for the smooth lower margin of the bigger chela, and for the fixed and movable fingers more elongate. *Corallianassa* sp. from the Paleocene (upper Danian) of Copenhagen (Denmark), described by Rasmussen (1971) is also ascribed to this genus. The Danish species differs from *C. rigoi* n. sp., for the bigger chela with more sinuous lower margin, and for the fixed and movable fingers more developed.

Other European thalassinids from the Upper Cretaceous are known by many species of *Protocallianassa* Beurlen, 1930, and by some chelae from the Maastrichtian of ENCI quarry of Maastricht, ascribed to *Calliax?* sp. (Swen *et al.*, 2001). The discovery of *C. rigoi* n. sp. is very important because attests the widespread of *Corallianassa* in the European seas during the Upper Cretaceous. *Corallianassa rigoi* n. sp. from the Upper Cretaceous (Aptian-Campanian) of Friuli-Venezia Giulia represents the first report of this genus in Italy.



Fig. 3 - a) *Corallianassa rigoi* n. sp., holotype, n. cat. MSNM i24681 (x 2.5); b) *Corallianassa rigoi* n. sp., n. cat. MSNM i26580 (x 2.3); c) *Corallianassa rigoi* n. sp., n. cat. MSNM i26582 (x 2.3).

Infraorder Anomura MacLeay, 1838
 Superfamily Galattheoidea Samouelle, 1819
 Family Galatheidae Samouelle, 1819
 Subfamily Galatheinae Samouelle, 1819
 Genus *Calteagalathea* nov.

Diagnosis: carapace, longer than wide, transversely convex; wide front-orbital margin; well-developed rostrum, enlarged at the base with parallel margins, both having three spines (median spine unknown); regions marked by cervical and branchiocardiac grooves; dorsal ornamentation with wide and irregular protuberances.

Etymology: from Val Caltea (Pordenone) where the studied specimens were discovered, and *Galathea* Fabricius, 1793, that shows some morphological affinities with the new genus.

Type species: *Calteagalathea friulana* n. sp.

Description: as for type species.

Calteagalathea friulana n. sp.

Fig. 4 (a-c)

Diagnosis: as for genus.

Etymology: from Friuli-Venezia Giulia Region where the studied specimens were discovered.

Holotype: MFSN 19969.

Paratype: MFSN 19965.

Stratigraphic range: Upper Cretaceous (Maastrichtian).

Type locality: Val Caltea (Pordenone).

Occurrence and measurements: two carapaces with incomplete rostra distally.
 MFSN 19965 – maximum width: 9.5; length excluding rostrum: 9.4
 MFSN 19969 – maximum width: 17.8; length excluding rostrum: 17.2

Description. Carapace, longer than wide, more convex transversely, wider posteriorly. Wide front-orbital margin. Well-developed rostrum, enlarged at the base, having lateral margins almost parallel, both having two small spines and a third stronger spine of which only base is preserved. Median part of rostrum not preserved. Surface of rostrum with weak granulations. Concave and raised supraorbital margin. Elongate lateral margins with spiny tubercles. Wide posterior margin, convex in median part and superficially carinate. Regions marked by cervical and branchiocardiac grooves. Wide epigastric lobes slightly curved. Slightly curved gastric regions, marked by weak hepatic groove and posteriorly by cervical groove. Well marked metagastric region extending backward with a narrow mesogastric process between epigastric lobes. Cardiac region marked backward by a postcervical depression. Median part of cardiac region marked by a transverse depression extending on branchial regions. Hepatic regions depressed. Subtriangular epibranchial region marked by cervical and branchiocardiac grooves. Elongate posterior branchial regions. Dorsal ornamentation with wide and irregular scabrous elevations, directed forward. These elevations are small and sparse on anterior lateral regions, stronger on gastric regions, several and relatively developed on median part, and well-developed on branchial and cardiac regions.

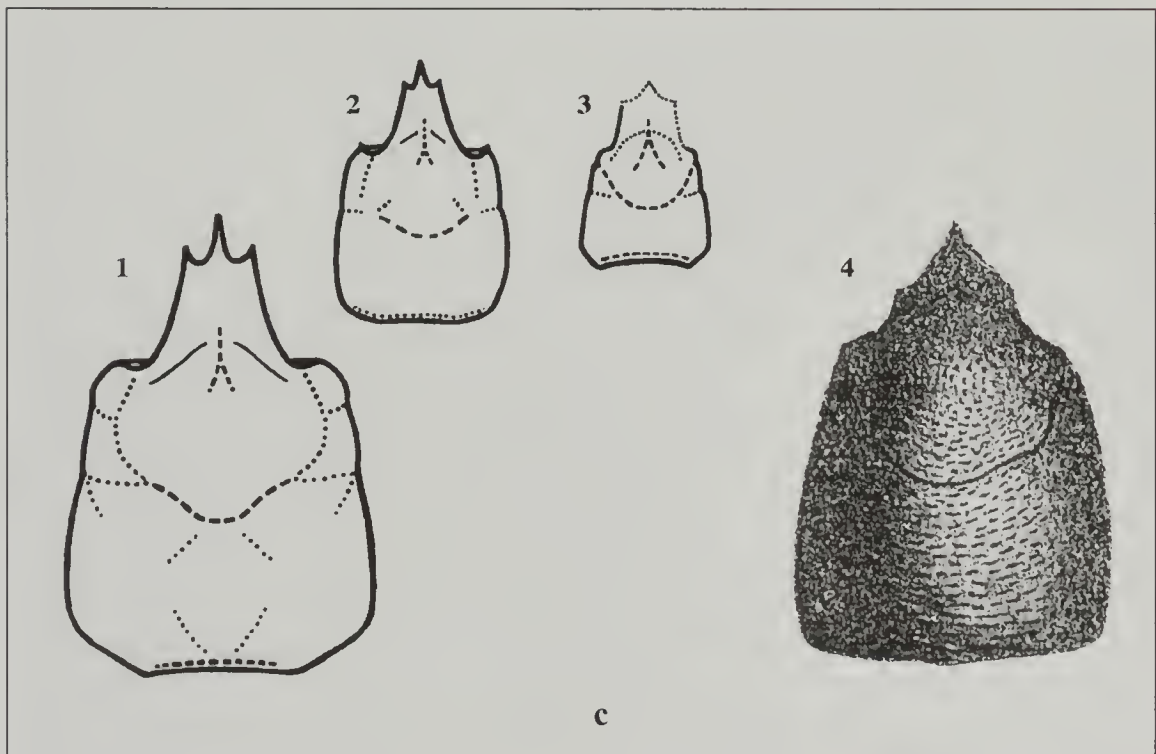
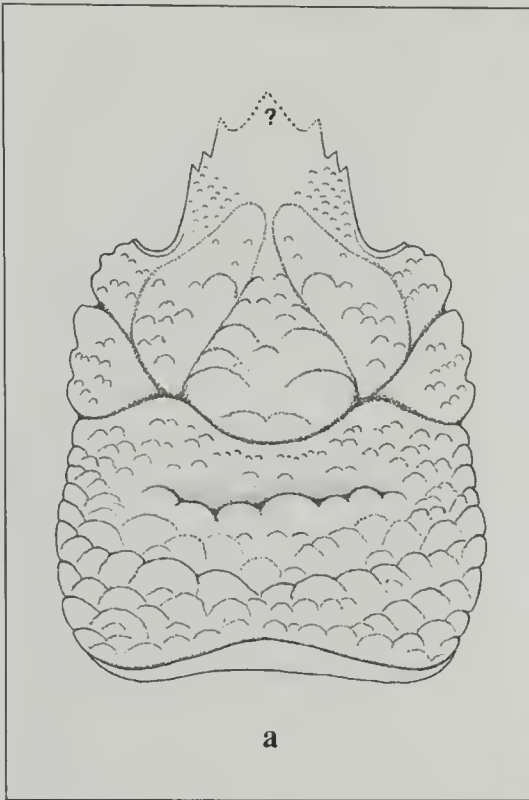


Fig. 4 - *Calteagalathea friulana* n. gen., n. sp., a) reconstruction of the carapace (ricostruzione del carapace); b) *Calteagalathea friulana* n. gen., n. sp., holotype (olotipo), n. cat. MFSN 19969 (x 2); c) the species of *Paragalathea* (Patrulius, 1960) (1c specie di *Paragalathea* (Patrulius, 1960)): 1) *P. straeleni* (Ruiz de Ganoa, 1943); 2) *P. nuizi* (Van Straelen, 1940); 3) *P. multisquamata* (Via Boada, 1981); 4) *P. verrucosa* (Moericke, 1897) (from Moericke, 1897, and Via Boada, 1981).

Discussion. The diagnostic characters of the family Galatheidae Samouelle, 1819, and of the three subfamilies Galatheinae Samouelle, 1819, Munidopsinae Ortmann, 1898, and Shinkaiinae Baba & Williams, 1998, were recently discussed by Schweitzer & Feldmann (2000a) and De Angeli & Garassino (2002).

The family Galatheidae Samouelle, 1819, includes the fossil genera *Acanthogalatea* Müller & Collins, 1991, *Eomunidopsis* Via Boada, 1981, *Lessinigalatea* De Angeli & Garassino, 2002, *Luisogalatea* Karasawa & Hayakawa, 2000, *Mesogalatea* Houša, 1963, *Palaeomunida* Lörenthey, 1901, *Paragalatea* Patrulius, 1960, *Protomunida* Beurlen, 1930, *Spathagalatea* De Angeli & Garassino, 2002; the fossil and Recent genera *Galatea* Fabricius, 1793, and *Munida* Leach, 1820; the Recent genera *Agonida* Baba & De Saint Laurent, 1995, *Alanus* Baba, 1991, *Allogalatea* Baba, 1960, *Allomunida* Baba, 1988, *Anomoeomunida* Baba, 1993, *Anoplionida* Baba & De Saint Laurent, 1995, *Bathymunida* Balss, 1914, *Cervimunida* Benedict, 1902, *Coralliogalatea* Baba & Javed, 1974, *Crosnierita* Macpherson, 1998, *Fennerogalatea* Baba, 1988, *Heteronida* Baba & De Saint Laurent, 1995, *Janetogalatea* Baba & Wicksten, 1997, *Lauriea* Baba, 1971, *Leiogalatea* Baba, 1969, *Nanogalatea* Tirmizi & Javed, 1980, *Neonida* Baba & De Saint Laurent, 1995, *Onconida* Baba & De Saint Laurent, 1995, *Paramunida* Baba, 1988, *Phylladorhynchus* Baba, 1969, *Plesionida* Baba & De Saint Laurent, 1995, *Pleuroncodes* Stimpson, 1860, *Raymunida* Macpherson & Machordom, 2000, and *Sadayoshia* Baba, 1969.

The morphological characters of the carapace of *Calteagalatea* n. gen. are different respect those of the known species having the carapace with transverse cristae and triangular rostrum. Some affinities are present only with the representatives of the fossil genus *Paragalatea* Patrulius, 1960, which have a wide rostrum without supraorbital spines (Fig. 4c). Patrulius (1960) described *Paragalatea* (as subgenus) on the type species *Galatea verrucosa* Moericke, 1889, giving the following description: “*Céfalothorax fortement convexe; rostre très large, sans démarcation nette à la base, à pointe obtuse tridentée, dépourvu du carène médiane. Ornamentation consistano le plus souvent en granules arrondis*”. Via Boada (1981, 1982), studying the Spanish galatheids, considered *Paragalatea* as genus, confirming the same diagnosis by Patrulius. Even though, *Calteagalatea* has some morphological characters similar to those of *Paragalatea*, such as the width of rostrum and the lack of supraorbital spines, it differs mainly for the presence of three spines along the margins of the rostrum, and for the dorsal ornamentation of the carapace with wide and irregular protuberances. Moreover, the rostrum is well marked at the base by two epigastric rises, the lateral margins are more sinuous, and the dorsal surface of the carapace has a postcervical depression.

Finally, a comparison between *Calteagalatea friulana* n. gen., n. sp. and some pictures of the holotype of *Paragalatea multisquamata* Via Boada, 1981, housed in the Seminary Museum of Barcelona, suggests that the Spanish species has a wider and more curved cervical groove, smaller, thicker and uniform granulation, more rectilinear lateral margins, and less deep postcervical depression (Fig. 4c).

Infraorder Brachyura Latreille, 1802
Section Dromiacea De Haan, 1833
Superfamily Homolodromioidea Alcock, 1900
Family Prosopidae v. Meyer, 1860
Subfamily Pithonotinae Glaessner, 1933
Genus *Pithonoton* v. Meyer, 1842

Type species: *Prosopon (Pithonoton) marginatum* v. Meyer, 1842

Pithonoton marginatum (v. Meyer, 1842)
Fig. 5

- 1842 – *Prosopon (Pithonoton) marginatum* v. Meyer; p. 70, Pl. 15 (fig. 3)
1842 – *Prosopon (Pithonoton) rostratum* (pars) v. Meyer; p. 74, Pl. 15 (fig. 6)
1860 – *Prosopon marginatum* v. Meyer; p. 198, Pl. 23 (figs. 8-9)
1869 – *Prosopon marginatum* v. Meyer in Gemmellaro; p. 11, Pl. 2 (figs. 48-49)
1889 – *Prosopon marginatum* v. Meyer in Moericke; p. 64, Pl. 6 (fig. 22)
1895 – *Prosopon marginatum* v. Meyer in Remes; p. 202, Pl. 2 (fig. 13)
1905 – *Prosopon marginatum* v. Meyer in Remes; p. 35
1925 – *Pithonoton marginatum* (v. Meyer) in Van Straelen; p. 363, Text-fig. 167
1925 – *Prosopon marginatum* v. Meyer in Beurlen; p. 473
1929 – *Pithonoton marginatum* (v. Meyer) in Glaessner; p. 322
1929 – *Pithonoton marginatum* (v. Meyer) in Lörenthey & Beurlen; p. 84, Pl. 3 (fig. 8)
1929 – *Pithonoton marginatum* (v. Meyer) in Beurlen; p. 126
1929 – *Pithonoton laevimarginatum* Lörenthey & Beurlen; p. 85, Pl. 4 (fig. 2)
1929 – *Pithonoton laevimarginatum* Lörenthey in Glaessner; p. 321
1929 – *Coelopus tuberculatus* Lörenthey & Beurlen; p. 94, Pl. 4 (fig. 1)
1929 – *Coelopus tuberculatus* Lörenthey in Glaessner; p. 123
1929 – *Pithonoton marginatum* var. *antecedens* Beurlen; p. 130, Text-fig. 3
1933 – *Pithonoton laevimarginatum* Lörenthey & Beurlen in Glaessner; p. 180
1933 – *Pithonoton marginatum* (v. Meyer) in Glaessner; p. 180
1933 – *Coelopus tuberculatus* Lörenthey & Beurlen in Glaessner; p. 181
1947 – *Pithonoton marginatum* (v. Meyer) in Bachmayer; p. 40
1951 – *Pithonoton marginatum* (v. Meyer) in Withers; p. 175, Text-figs. 4-6
1960 – *Pithonoton marginatum* (v. Meyer) in Patruilius; p. 253
1963 – *Pithonoton marginatum* (v. Meyer) in Houša; p. 106, Pl. 1 (fig. 4)
1964 – *Pithonoton marginatum* (v. Meyer) in Bachmayer; p. 131
1966 – *Pithonoton marginatum* (v. Meyer) in Patruilius; p. 510, Pl. 31 (figs. 15-16)
1966 – *Pithonoton rusticum* Patruilius; p. 511, Pl. 31 (figs. 17-18)
1967 – *Dromiopsis* ? in Levin; p. 227, Text-figs. 2-3
1969 – *Pithonoton marginatum* (v. Meyer) in Bachmayer; p. 121, Text-fig. 148
1970 – *Pithonoton marginatum* (v. Meyer) in Mutiu & Bădăluță; p. 453, Pl. 2 (fig. 8)
1979 – *Pithonoton marginatum* (v. Meyer) in Förster; p. 25, Text-figs. 5C-6B
1980 – *Pithonoton marginatum* (v. Meyer) in Morris; p. 14
1981 – *Pithonoton marginatum* (v. Meyer) in Götzner; p. 416, Text-fig. S. 417
1988 – *Pithonoton marginatum* (v. Meyer) in Wehner; p. 79, Text-fig. 23, Pl. 5
(fig. 8), Pl. 6 (fig. 1)
2000 – *Pithonoton marginatum* (v. Meyer) in Müller, Krobicki & Wehner; p. 54,
Text-fig. 12, Fig. 18B
2005 – *Pithonoton marginatum* (v. Meyer) in Garassino, De Angeli & Schweigert;
p. 71, Text-figs. 2, 3

For an exhaustive list of prosopid literature see Müller *et al.* (2000).

Stratigraphic range: Upper Jurassic (Oxfordian-Kimmeridgian).

Type locality: Altopiano Prat (Udine).

Occurrence and measurements: one complete carapace.

MFSN 15763 – width of carapace: 8.4; length of carapace: 11.4

Discussion. The studied carapace has the typical morphological characters of the family Prosopidae v. Meyer, 1860, corresponding to the description and representation of *Pithonoton marginatum* (v. Meyer, 1842). In fact, the carapace has bilobate front; wide orbits; regions well marked by grooves; raised epigastric lobes; metagastric region well marked by cervical groove; elongate and narrow anterior mesogastric process between protogastric regions; urogastric region well marked by posterior groove; subpentagonal cardiac region, restricted posteriorly and well marked by branchiocardiac grooves; granulate dorsal surface with three tubercles; hepatic regions marked posteriorly by cervical groove; elongate branchial regions incised by epi-branchial groove.

Wehner (1988) and Müller *et al.* (2000) pointed out that this species is widespread in the Upper Jurassic of France, Portugal, S Germany, Switzerland, Romania, Poland, Czech Republic, and Italy.

The discovery of prosopids in Italy was until now limited to the Tithonian of Sicily (Gemmellaro, 1869). The report of prosopids from the Upper Jurassic of Friuli-Venezia Giulia extends the geographical distribution of these decapods also in N Italy. *Pithonoton marginatum* from the Oxfordian-Kimmeridgian (Upper Jurassic) of Friuli-Venezia Giulia is the oldest brachyuran known to date in Italy.



Fig. 5 - *Pithonoton marginatum* (v. Meyer, 1842), n. cat. MFSN 15763 (x 5.4).

Superfamily Dromioidea De Haan, 1833

Family Dynomenidae Ortmann, 1892

Genus *Graptocarcinus* Roemer, 1887

Type species: *Graptocarcinus texanus* Roemer, 1887, by monotypy

Graptocarcinus bellonii Collins & Dieni, 1995

Fig. 6

1995 – *Graptocarcinus bellonii* Collins & Dieni; p. 70, Text-figs. 2-1, 2, 4

Stratigraphic range: Upper Cretaceous (Maastrichtian).

Type locality: Borgo Vigant (Udine).

Occurrence and measurements: one complete carapace.

MFSN 16937 – maximum width of carapace: 37.3; maximum length of carapace: 27.4; width of front-orbital margin: 12.8; width of front: 7.4; width of posterior margin: 9.8.

Discussion. The studied specimen is well-preserved, having a front-orbital margin typical of the family Dynomenidae Ortmann, 1892. The main morphological characters are: rounded hexagonal carapace, wider than long (ratio width/length = 1.36), convex in both sections; curved anterior margin; short front-orbital margin (ratio width of front-orbital margin/width of carapace = 0.34), extending over anterolateral margin; narrow front margin curved backward, incomplete in median part; suboval orbits; concave supraorbital margin, superficially raised, marked along margins by a triangular extraorbital tooth; granulate and convex anterolateral margins; broadly rounded anterolateral angle; granulate and convex posterolateral margin; very narrow and concave posterior margin; dorsal regions weakly marked; front region with median longitudinal depression; slightly curved meso- and metagastric regions, marked posteriorly by a curved groove; weak median longitudinal groove present; weak wide rhomboid depression in median part of carapace; very narrow intestinal region; dorsal surface of carapace with tubercles, mainly placed in hepatic, branchial, and gastric regions; smooth pterygostomial regions with weak subhepatic groove.

The above-mentioned morphological characters are typical of *Graptocarcinus bellonii* Collins & Dieni, 1995, from the Upper Cretaceous (Cenomanian) of Col dei Schiosi (Altopiano del Cansiglio, Pordenone) (Collins & Dieni, 1995). A comparison with the holotype (DGP. B241), housed in the Museo di Geologia e Paleontologia dell'Università degli Studi di Padova, resulted in the following observations: the studied specimen is more complete than the holotype, lacking only the front-orbital and anterolateral margins; the dorsal ornamentation of the studied specimen is less uniform; the branchial, hepatic, and gastric regions of the studied specimen have smaller tubercles, while the tubercles are rare in the median part. The different ornamentation of the surface of the carapace between the holotype and the studied specimen could be related to different ontogenetic stages since the carapace of the studied specimen is three times larger than that of the holotype.

Graptocarcinus includes the following species: *G. bellonii* Collins & Dieni, 1995 (Cenomanian – Italy), *G. maastrichtensis* Fraaije, 1996 (Maastrichtian – The

Netherlands), *G. muiri* Stenzel, 1944 (Aptian – Mexico), and *G. texanus* Roemer, 1887 (Cenomanian – United States) (redescribed by Stenzel, 1944, and Wright & Wright, 1950). *Graptocarcinus texanus* is also reported from the Cenomanian of Devon (SW England) (Wright & Collins, 1972), from the Cenomanian of Spain (Via Boada, 1981), and in the “*Craie à Baculites*” (Maastrichtian) of Fresville (France) (Remy, 1955). Wright & Collins (1972) considered *Cyphonotus integrimarginatus* Wright & Wright, 1950 (Cenomanian – England), and *Necrocarcinus avicularis* Fritsch, 1857 (Cenomanian – Czech Republic) as synonyms with *G. texanus*. Finally, Wright & Collins (1972) studied the morphological differences between *G. texanus* and *G. muiri*, establishing *G. muiri* as a junior synonym with *G. texanus*.



Fig. 6 - *Graptocarcinus bellonii* Collins & Dieni, 1995, n. cat. MFSN 16937 (x 2.5).

Section Eubrachyura De Saint Laurent, 1980
 Superfamily Raninoidea De Haan, 1839
 Family Raninidae De Haan, 1839
 Genus *Lophoranina* Fabiani, 1910

Type species: *Ranina marestiana* König, 1825

Lophoranina marestiana (König, 1825)
 Figs. 7 (a-d)

1817 – *Remipes sulcatus* in Desmarest; p. 512

1822 – *Ranina Aldrovandi* in Desmarest; p. 512

- 1825 – *Ranina marestiana* König; p. 2, Pl. 1 (fig. 15)
1859 – *Ranina Marestiana* König in Reuss; p. 20, Pl. 5 (figs. 1, 2)
1872 – *Ranina Maresiana* (sic!) König in A. Milne Edwards; p. 8
1875 – *Ranina Marestiana* König in Bittner; p. 64, Pl. 1 (figs. 1, 2)
1883 – *Ranina Marestiana* König in Bittner; p. 300, Pl. 1 (figs. 1, 2)
1933 – *Ranina* cfr. *Marestiana* König in Di Salvo; p. 12
1959 – *Lophoranina marestiana* (König) in Via Boada; p. 365
1866 – *Ranina marestiana* König in Ancona; p. 402, Pl. 1-3
1908 – *Ranina marestiana* König in Fabiani; p. 169
1910a – *Ranina marestiana* König in Fabiani; p. 25
1910b – *Ranina* (*Lophoranina*) *marestiana* König in Fabiani; p. 5
1915 – *Ranina marestiana* König in Dainelli; p. 699
1933 – *Ranina* cfr. *Marestiana* König in Di Salvo; p. 12
1959 – *Lophoranina marestiana* (König) in Via Boada; p. 365
1966 – *Ranina marestiana* König in Ancona; p. 402, Pl. 1-3
1966 – *Lophoranina marestiana* (König) in Via Boada; p. 240, Text-figs. 1-3, Pl. 1
1969 – *Lophoranina marestiana* (König) in Via Boada; p. 104, Text-fig. 11, Pl. 5
(fig. 1), Pl. 6 (fig. 1)
1988 – *Lophoranina marestiana* (König) in Beschin, Busulini, De Angeli &
Tessier; p. 175, Text-fig. 6, Pl. 5 (figs. 2-4), Pl. 6 (figs. 1a-c)
1998 – *Lophoranina marestiana* (König) in Beschin, Busulini, De Angeli &
Tessier; p. 20, Text-figs. 6 (2-3), 8 (1)
1994 – *Lophoranina marestiana* (König) in Beschin, Busulini, De Angeli &
Tessier; p. 173, Pl. 3 (fig. 4)
2001 – *Lophoranina marestiana* (König) in De Angeli & Beschin; p. 17, Text-fig. 12

Stratigraphic range: lower Eocene (Ypresian).

Type locality: Almadis (Castelnuovo del Friuli, Pordenone).

Occurrence: four incomplete specimens. MFSN 29047, 29048, 29049, 29050.

Discussion. *Lophoranina* Fabiani, 1910 (= *Palaeonotopus* Brocchi, 1877) is a fossil genus having granulate transverse cristae on carapace, like the fossil and Recent *Ranina* Lamarck, 1801.

Lophoranina includes six Indo-Pacific species: *L. persica* (Withers, 1932) (Eocene – Iran), *L. baveri* (A. Milne Edwards in Withers, 1932) (Eocene – Pakistan), *L. soembaensis* (Van Straelen, 1938) (lower Eocene – Indonesia), *L. toyosimai* (Yabe-Sugiyama, 1935) (Eocene – Japan), *L. kimmerlingi* (Van Straelen, 1932) (Eocene – Borneo), *L. quinquespinosa* (Rathbun, 1945) (Neogene – Fiji Islands); 13 European and African species: *L. marestiana* (König, 1825) (Eocene – Spain, Italy and North Africa), *L. marestiana* var. *avesana* (Bittner, 1883) (Eocene – Italy), *L. bittneri* (Lörenthey, 1902) (Eocene – Spain, Hungary and Italy), *L. reussi* (Woodward, 1866) (middle/upper Eocene – Spain, Hungary and Italy), *L. straeleni* Via Boada, 1959 (lower/middle Eocene – Spain and Italy), *L. aculeata* (A. Milne Edwards, 1881) and *L. barroisi* (Brocchi, 1877) (Eocene – France), *L. aldrovandii* (Ronzi, 1820) (Eocene? – N Italy?), *L. laevifrons* (Bittner, 1875) (Eocene – Italy), *L. maxima* Beschin, Busulini, De Angeli & Tessier, 2004 (middle Eocene – Italy), *L. tchihatcheffi* (A. Milne Edwards, 1866)

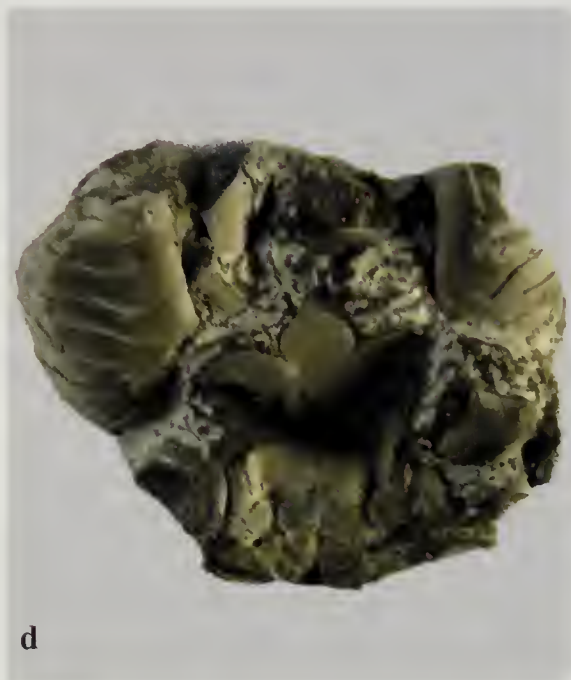


Fig. 7 - a) *Lophoranina marestiana* (König, 1825), n. cat. MFSN 29047 (x 1.5); b) *Lophoranina marestiana* (König, 1825), n. cat. MFSN 29048 (x 1.2); c) *Lophoranina marestiana* (König, 1825), n. cat. MFSN 29049 (x 1.2); d) *Lophoranina marestiana* (König, 1825), n. cat. MFSN 29050 (x 2).

(Eocene – Greece), *L. levantina* Lewy, 1977 (Eocene – Israel); six American species: *L. precocious* Feldmann, Vega, Tucker, Garcia-Barrera & Avendano, 1996 (Upper Cretaceous – Mexico), *L. cristaspina* Vega, Feldmann, Garcia-Barrera, Filkorn, Pimentel & Avendano, 2001 (middle Eocene – Mexico), *L. bisopii* Squires & Demetrios, 1992 (Eocene – Mexico), *L. raynoriae* Blow & Manning, 1996, and *L. rossi* Blow & Manning, 1996 (middle Eocene – United States), *L. georgiana* (Rathbun, 1935) (lower Oligocene – United States), and *L. porifera* (Woodward, 1886) (lower Oligocene – Trinidad). Via Boada (1959, 1966, 1969) considered *Lophoranina reussi* var. *gonii* (Ruiz De Gaona, 1943) from the Eocene of Spain to be a synonym with *L. reussi*.

The studied specimens, even though incomplete, have the typical morphological characters of *L. marestiana*, such as the width and ornamentation of the front and supraorbital regions, and the number (16-17) of the granulate transverse cristae. The specimen MFSN 29050 preserves the sternum, enlarged between the basis of chelipeds, and reduced at the base of pereopods II.

Lophoranina marestiana is particularly widespread in the Cuisian and Lutetian levels of Veneto (Beschin *et al.*, 1988). This species was already known in Friuli-Venezia Giulia by four incomplete carapaces, discovered in Buttrio and Valle del Natisone by Tellini, and reported by Dainelli (1915).

Subsection Heterotremata Guinot, 1977
Superfamily Portunoidea Rafinesque-Schmaltz, 1815
Family Portunidae Rafinesque-Schmaltz, 1815
Subfamily Portuninae Rafinesque-Schmaltz, 1815
Genus *Portunus* Weber, 1795

Type species: *Cancer pelagicus* Linnaeus, 1758

Portunus monspeliensis (A. Milne Edwards, 1860)
Fig. 8

- 1860 – *Neptunus monspeliensis* A. Milne Edwards; p. 232
- 1860 – *Neptunus monspeliensis* A. Milne Edwards; Pl. 4 (fig. 1), Pl. 5 (fig. 1)
- 1860 – *Neptunus granulatus* A. Milne Edwards; p. 241, Pl. 3 (fig. 1), Pl. 7 (fig. 2)
- 1888 – *Neptunus granulatus* A. Milne Edwards in Ristori; p. 215, Pl. 4 (figs. 5-11)
- 1893 – *Neptunus* cfr. *granulatus* A. Milne Edwards in Bittner; p. 11
- 1897 – *Neptunus* cfr. *granulatus* A. Milne Edwards in Lörenthey; p. 159
- 1898 – *Neptunus* cfr. *granulatus* A. Milne Edwards in Lörenthey; p. 110, 153,
Pl. 9 (figs. 2, 3)
- 1909 – *Neptunus granulatus* A. Milne Edwards in Lörenthey; p. 242, Pl. 2 (figs. 1, 2)
- 1929 – *Neptunus granulatus* A. Milne Edwards in Lörenthey & Beurlen; p. 188,
Pl. 13 (figs. 3, 4), Pl. 14 (figs. 1, 4)
- 1950 – *Neptunus granulatus* A. Milne Edwards in Comaschi Caria; p. 324, Pl. 1
- 1956 – *Neptunus granulatus* A. Milne Edwards in Comaschi Caria; p. 284, 288,
P. 1 (figs. 1-7), Pl. 2 (figs. 1-6), Pl. 3 (figs. 1, 2)
- 1968 – *Neptunus granulatus* A. Milne Edwards in Stancu & Andreescu; p. 466,
Pl. 7 (fig. 85)

- 1979 – *Portunus granulatus* A. Milne Edwards in Förster; p. 94
 1979 – *Portunus monspeliensis* (A. Milne Edwards) in Müller; p. 274, 280, 288, Pl. 18
 1984 – *Portunus monspeliensis* (A. Milne Edwards) in Müller; p. 79, Pl. 62
 (figs. 1, 2)
 1991 – *Portunus monspeliensis* (A. Milne Edwards) in Marras & Ventura; p. 108,
 Pl. 1 (figs. 1-4), Pl. 2 (figs. 1, 4), Pl. 3 (figs. 1-3)
 1992 – *Portunus granulatus* A. Milne Edwards in De Angeli & Marangon; p. 176

Stratigraphic range: middle Miocene (Langhian).

Type locality: Meduno (Pordenone).

Occurrence: two complete specimens. MSNM: i26584, i26585.

Discussion. The studied specimens preserve the wide median and posterior parts of carapace, an elongate spine in the anterolateral angle, wide branchial regions with a transverse carina, and strongly granulated dorsal surface of carapace. Moreover, specimen MSNM i26585 preserves some parts of the sternum, the narrow abdomen typical of male, and some articles of the left pereopod, while specimen MSNM i26584 preserves some parts of the sternum, the wide abdomen typical of female, chelipeds with elongate and subcylindrical propodus, and elongate movable and fixed fingers with dentate occludent margins.

The studied specimens are ascribed to *Portunus monspeliensis* (A. Milne Edwards, 1860) (= *P. granulatus* A. Milne Edwards, 1860), widespread in the Miocene levels of S Europe (Hungary, France, Austria) and N Africa (Egypt). Ristori (1888), Lörenthey (1909), Comaschi Caria (1950, 1956), and Marras & Ventura (1991) reported this species in Italy from the Miocene of Sardinia and Emilia Romagna, while the presence of *P. monspeliensis* from the Rupelian (lower Oligocene) of Bacino Ligure Piemontese is dubious. In fact, Allasinaz (1987) pointed out that the specimens of this species, discovered in Piedmont, could belong to a subspecies similar to *P. monspeliensis*.



Fig. 8 - *Portunus monspeliensis* (A. Milne Edwards, 1860), n. cat. MSNM i26584 (x 0.6).

Subfamily Polybiinae Ortmann, 1893
Genus *Portunites* Bell, 1858

Type species: *Portunites incertus* Bell, 1858, by original designation.

Portunites rosenfeldi n. sp.
Figs. 9 (a, b), 10

Diagnosis: carapace, wider than long, weakly convex, with five anterolateral spines (including extraorbital spine); median regions marked by deep grooves; very narrow urogastric region; cardiac region divided in two lobes by median groove; branchial region with very angled epibranchial transverse rise, and meso-branchial longitudinal rise.

Etymology: from C. Rosenfeld who reported for the first time the presence of this crab from Almadis.

Holotype: MFSN 28995.

Paratype: MFSN 29046.

Stratigraphic range: lower Eocene (Ypresian).

Type locality: Almadis (Castelnuovo del Friuli, Pordenone).

Occurrence: two specimens with carapace lacking of front and having chelipeds. MFSN 28995, 29046.

Description. Carapace weakly convex in longitudinal section, wider than long, having maximum width located at last anterolateral spine. Frontal margin partially preserved in holotype with supraorbital margin having well-developed triangular, extraorbital spine directed forward, and short supraorbital tooth, marked by a fissure. Infraorbital margin wider anteriorly and with spine. Convex anterolateral margins with five spines (including extraorbital spine). Converging posterolateral margins, incomplete posteriorly. Regions well marked by deep grooves. Frontal region and epigastric lobes unknown. Oval protogastric regions inflated and marked by longitudinal groove anteriorly. Wide metagastric region with convex posterior margin and very elongate anterior mesogastric process closed between protogastric regions. Very narrow urogastric region. Cardiac region well marked along margins by branchiocardiac groove, divided into two raised lobes by median longitudinal groove. Cardiac region very narrow posteriorly, bearing a tubercle. Hepatic regions with oval raised lobe. Wide branchial region with transverse granulate rise, strongly angled, extending parallel to cervical groove to the base of fifth anterolateral spine. Mesobranchial regions with narrow, longitudinally elongate ridge. Dorsal surface of carapace with small granulations, more frequent on tips of regions and branchial ridges. Left and right chelipeds well developed. Right subcylindrical propodus with two weak longitudinal carinae on outer surface. Very elongate movable and fixed fingers with dentate occludent margins. Ventral parts not preserved.

Discussion. Schweitzer & Feldmann (2000b) discussed *Portunites* Bell, 1858, including the known species as follows: *P. incerta* Bell, 1858, *P. stintoni* Quayle & Collins, 1981, and *P. sylviae* Quayle & Collins, 1981 (lower Eocene – England), *P. angustata* Collins, Moody & Sandman, 1999 (lower Eocene –

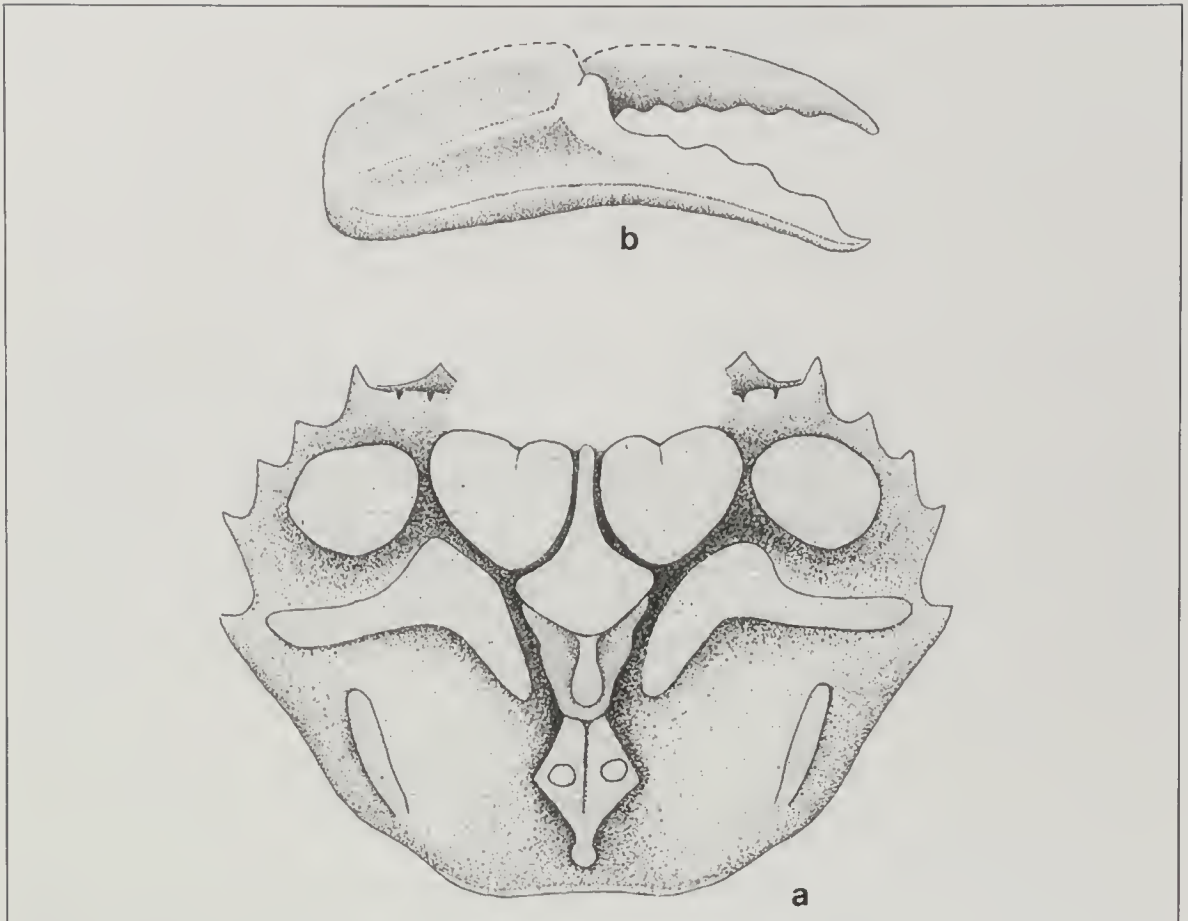


Fig. 9 - *Portunites rosenfeldi* n. sp.; a) reconstruction of the carapace (ricostruzione del carapace); b) reconstruction of the chela (ricostruzione della chela).

Tunisia), *P. eocenica* Lörenthey in Lörenthey & Beurlen, 1929 (type is lost, Quayle & Collins, 1981) (Eocene – Hungary), *P. kattachiensis* Karasawa, 1992 (middle Eocene – Japan), *P. nodosus* Schweitzer & Feldmann, 2000 (Eocene – United States), and *P. insculpta* Rathbun, 1926 (middle Eocene – United States).

Portunites insculpta, *P. kattachiensis*, *P. nodosus*, *P. incerta*, and *P. sylviae* differ from *P. rosenfeldi* n. sp. because the median regions are marked by less deep grooves, wider urogastric region, and cardiac region not divided by median groove. *Portunites eocenica* differs from the new species in the shape of the carapace. *Portunites rosenfeldi* has a concave posterolateral margins, a wider urogastric region with three aligned tubercles, and a more developed subcircular cardiac region.

Portunites rosenfeldi n. sp. has affinities with *P. angustata*, and *P. stintoni* having very narrow urogastric regions. However, these two species differ from the new species by having branchial lobe located on the margins of the urogastric region and for the epibranchial transverse ridge being more curved and more parallel to the cervical groove. Moreover, *P. angustata* has protogastric regions with some tubercles. Finally, *Portunites rosenfeldi* n. sp. differs from the known species for the location of the epibranchial rise creating a wide transverse convexity, wider and angled at the margins of the protogastric regions.

Portunites, widespread in the Eocene levels of North and Central Europe, is reported for the first time in Italy.



Fig. 10 - *Portunites rosenfeldi* n. sp., holotype (olotipo), n. cat. MFSN 28995 (x 2.5).

Superfamily Xanthoidea MacLeay, 1838
Family Pilumnidae Samouelle, 1819
Genus *Titanocarcinus* A. Milne Edwards, 1863

Type species: *Titanocarcinus serratifrons* A. Milne Edwards, 1863

Titanocarcinus raulinianus A. Milne Edwards, 1863

Fig. 11

- 1863 – *Titanocarcinus raulinianus* A. Milne Edwards; p. 37
1864 – *Titanocarcinus raulinianus* A. Milne Edwards in A. Milne Edwards;
Pl. 9 (figs. 3-4)
1893 – *Titanocarcinus raulinianus* A. Milne Edwards in Ristori; p. 212
1898 – *Titanocarcinus raulinianus* A. Milne Edwards in Lörenthey; p. 57
1903 – *Titanocarcinus raulinianus* A. Milne Edwards in Lörenthey; p. 113,
Pl. 2 (fig. 1)
1929 – *Titanocarcinus raulinianus* A. Milne Edwards in Lörenthey & Beurlen;
p. 234, P. 11 (figs. 6- 7)
1933 – *Titanocarcinus raulinianus* A. Milne Edwards in Di Salvo; p. 30, Pl. 2 (fig. 9)



Fig. 11 - *Titanocarcinus raulinianus* A. Milne Edwards, 1863, n. cat. MFSN 29051 (x 2.5).

1956 – *Titanocarcinus raulinianus* A. Milne Edwards in Roger; p. 356, P. 10 (fig. 10)

1969 – *Titanocarcinus raulinianus* A. Milne Edwards in Via Boada; p. 420

1991 – *Titanocarcinus raulinianus* A. Milne Edwards in Müller & Collins; p. 49

2000 – *Titanocarcinus raulinianus* A. Milne Edwards in Beschin, Busulini,
De Angeli, Tessier & Ungaro; p. 8, Pl. 2 (fig. 3)

2001 – *Titanocarcinus raulinianus* A. Milne Edwards in De Angeli & Beschin; p. 36

Stratigraphic range: middle Eocene (Lutetian).

Type locality: Casali Ottelio (Manzano, Udine).

Occurrence: one incomplete specimen. MFSN 29051.

Discussion. The studied specimen belongs to *T. raulinianus* and exhibits the typical regions of carapace and the dorsal ornamentation of the carapace with tubercles. A. Milne Edwards (1863), Lörenthey (1898), and Lörenthey & Beurlen (1929) reported this species from the middle Eocene of France and from the late Eocene of Hungary; while Ristori (1893), Di Salvo (1933), and Beschin *et al.* (2000) reported this species in Italy from the lower Eocene of the Gecchelina quarry of Monte di Malo (Vicenza), and from the middle Eocene of Monte Saraceno (Gargano, Puglia) and Monreale (Sicily).

Titanocarcinus includes many species from the Cretaceous to Miocene (Glaessner, 1969). Collins & Morris (1978) and later Schweitzer *et al.* (2002) suggested that *Titanocarcinus* could be a synonym with *Lobonotus* A. Milne Edwards, 1864. Schweitzer *et al.* (2004) pointed out the morphological characters of these

two genera: *Lobonotus* has a carapace with four or five lateral spines and very wide and trilobate cardiac region, while *Titanocarcinus* usually has a longitudinal groove in the protogastric region.

In Italy, besides *T. raulinianus*, the following species are present: *T. aculeatus* Busulini, Tessier & Visentin, 1984, and *T. euglyphos* Bittner, 1875 (middle Eocene – San Giovanni Ilarione and Valle del Chiampo, Verona and Vicenza), *T. kochii* Lörenthey, 1898 (upper Eocene – Monreale, Sicily), *T. sismondai* A. Milne Edwards, 1864 (Miocene – Turin, Piedmont), and *T. edwardsi* (Sismonda, 1846) (Pliocene – Piedmont). Finally, we note that *T. subovalis* Ristori, 1896, from the Pliocene of Tuscany possesses a shape and dorsal characters of the carapace that are different from those of *Titanocarcinus*, while *T. sculptus* Ristori, 1891, from the Pliocene of Mucigliani (Siena), is a synonym with *Chlinocephalus demissifrons* Ristori, 1886 (Garassino *et al.*, 2004).

Conclusion

The studied specimens from the Mesozoic and Cenozoic of Friuli Venezia-Giulia extend the knowledge of Italian decapods.

Some chelae are ascribed to *Corallianassa rigoi* n. sp. from the Cretaceous (Aptian-Campanian) of Monte Ciaurlec (Pordenone). *Corallianassa* Manning, 1987, known from the Upper Cretaceous of The Netherlands and from the Paleocene of Denmark, and widespread today in the Indo-Pacific Ocean and the Eastern Pacific American coasts, is reported for the first time in Italy. *Calteagalathea* n. gen. is described from the Upper Cretaceous (Maastrichtian) of Val Caltea (Pordenone). Nine species of galatheids are known to date in Italy: *Galathea berica* De Angeli & Garassino, 2002, *Galathea* cfr. *G. weinfurteri* Bachmayer, 1950, *G. valmaranensis* De Angeli & Garassino, 2002, *Acanthogalathea parva* Müller & Collins, 1991, *Acanthogalathea feldmanni* De Angeli & Garassino, 2002, *Lessinigalathea regale* De Angeli & Garassino, 2002, *Spathagalathea minuta* De Angeli & Garassino, 2002, *Palaeomunida defecta* Lörenthey, 1901, and *Palaeomunida multicristata* De Angeli & Garassino, 2002, from the Eocene and Oligocene of Veneto and Sicily (Di Salvo, 1933; De Angeli & Garassino, 2002). *Calteagalathea friulana* n. gen., n. sp. represents the oldest galatheid known to date in Italy, showing morphological affinities with the representatives of *Paragalathea*, widespread in the Upper Jurassic and Cretaceous of Europe. The discovery of *Pithonoton marginatum* (v. Meyer, 1842) from the Upper Jurassic (Oxfordian-Kimmeridgian) of Altopiano Prat (Udine) is very interesting since this prosopid represents the oldest brachyuran known to date in Italy. Other Italian prosopids, besides *Pithonoton marginatum* (v. Meyer, 1842) (= *Prosopon marginatum* v. Meyer, 1842 in Gemmellaro, 1869), are *Pithonoton bidentatum* (Reuss, 1859) (= *Prosopon etalloni* Gemmellaro in Gemmellaro, 1869), and *Pithonoton grande* (v. Meyer, 1860) (= *Prosopon polyphemi* Gemmellaro in Gemmellaro, 1869), described by Gemmellaro (1869) for the “*Terebratula janitor*” limestones from the Upper Jurassic (Tithonian) of Sicily. The discovery of one

well-preserved specimen of *Graptocarcinus bellonii* attests to the spread of this dynomenid in the Upper Cretaceous (Maastrichtian) of Friuli-Venezia Giulia, while new specimens of *Lophoranina marestiana* (König, 1825) attests to the widespread distribution of this species in the Eocene of Veneto and Friuli-Venezia Giulia. Beschin *et al.* (1988, 1991) reported many genera and species of the family Raninidae De Haan, 1839, from the Eocene of Veneto. *Portunites* Bell, 1858, from the Eocene of N Europe, N Africa, Japan and N America, is reported for the first time in Italy with *P. rosenfeldi* n. sp. The discovery from the middle Miocene (Langhian) of Meduno (Pordenone) of some specimens of *Portunus monspeliensis* (A. Milne Edwards, 1860) is also important. In fact, this species is reported for the first time in Friuli-Venezia Giulia and its presence attests to the widespread distribution of this portunid in the Mediterranean Sea during the Miocene. Finally, *Titanocarcinus raulinianus* A. Milne Edwards, 1863, is a fossil species that is widespread in the Tertiary of France, Hungary and Italy.

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